

CLAIMS:

~~1. A diversity transmission system~~
comprising:

a first modulator for modulating a
5 first set of information signals on to a first radio
carrier frequency;

a second modulator for modulating at
least one of a second set of information signals on
to a second radio carrier frequency;

10 a first transmit power amplifier for
said modulated signal at said first carrier
frequency;

a second transmit power amplifier for
said modulated signal at said second carrier
15 frequency; and

a radio frequency combining network
for combining the outputs of said first and second
transmit power amplifiers and coupling the combined
signal to a first antenna for transmission.

20 2. The diversity transmission system of
claim 1 further comprising:

a third modulator for modulating said
second set of information signals on to said second
radio carrier frequency; and

25 a third transmit power amplifier for
said third modulated signal at said second carrier
frequency, the output of which is fed to a second
antenna for transmission.

3. The diversity transmission system of
~~30 claim 1 further comprising:~~

DISSET APP CLAIMS

~~a third modulator for modulating said~~
second set of information signals on to said second
radio carrier frequency;

a fourth modulator for modulating at
5 least one of said first set of information signals on
to said first radio carrier frequency;

a third transmit power amplifier for
amplifying a signal generated by said third
modulator;

10 a fourth transmit power amplifying a
signal generated by said fourth modulator; and

a radio frequency combining network
for combining outputs of said third and fourth
transmit power amplifiers and coupling the combined
15 signal to a second antenna for transmission.

4. A diversity transmission system
according to claim 2, wherein said second antenna is
spaced many wavelengths from said first antenna so as
to obtain maximum spatial diversity gain.

20 5. A diversity transmission system
according to claim 3, wherein said second antenna is
spaced many wavelengths from said first antenna so as
to obtain maximum spatial diversity gain.

6. A diversity transmission system
25 according to claim 1, wherein said radio-frequency
combining networks are directional couplers.

7. A diversity transmission system
according to claim 3, wherein said radio-frequency
~~combining networks are directional couplers.~~

Insert new claims

~~8. A diversity transmission system~~
according to claim 1, wherein said radio-frequency
combining networks are multiplexing filters.

9. A diversity transmission system
5 according to claim 3, wherein said radio-frequency
combining networks are multiplexing filters.

10. A diversity transmission system
according to claim 2, wherein said at least one
signal fed to said second modulator is delayed or
10 advanced with respect to the same signal applied to
said third modulator.

11. A diversity transmission system
according to claim 3, wherein said at least one
signal fed to said second modulator is delayed or
15 advanced with respect to the same signal applied to
said third modulator; and
said at least one signal fed to said
fourth modulator is delayed or advanced with respect
to the same signal applied to said first modulator.

20 12. A diversity transmission system
according to claim 10, wherein said at least one
signal is delayed or advanced by a whole number of
bit or symbol periods.

13. A diversity transmission system
25 according to claim 11, wherein said at least one
signals are delayed or advanced by a whole number of
~~bit or symbol periods.~~

DELET NEW CLAIMS

~~14. A diversity transmission system~~
comprising:

a first modulator for modulating a
first set of information signals on to a first
5 carrier frequency;

a second modulator for modulating at
least one of a second set of information signals on
to a second carrier frequency;

a first transmit power amplifier for
10 said modulated signal at said first carrier
frequency;

a second transmit power amplifier for
said modulated signal at said second carrier
frequency;

15 an antenna multiplexing filter that
combines an output of said first transmit power
amplifier with at least one other signal having at
least a third carrier frequency intended for
transmission from the same antenna; and

20 a radio frequency combining network
for combining the outputs of said antenna
multiplexing filter and said second transmit power
amplifier and coupling the combined signal to a first
antenna for transmission.

25 ~~15. A diversity transmission system~~
comprising:

a first modulator for modulating a
first set of information signals on to a first
carrier frequency;

30 a second modulator for modulating at
least one of a second set of information signals on
~~to a second radio carrier frequency;~~

DISPRT 4940 CLAIMS

~~a first transmit power amplifier for~~
said modulated signal at said first carrier
frequency;

a second transmit power amplifier for
5 said modulated signal at said second carrier
frequency;

a first antenna multiplexing filter
that combines an output of said first transmit power
amplifier with at least one other signal having at a
10 least a third carrier frequency intended for
transmission from the first same;

a second antenna multiplexing filter
that combines an output of said second transmit power
amplifier with at least one other signal having at
15 least a fourth carrier frequency intended for
transmission from the same antenna; and

a radio frequency combining network
for combining the outputs of said first and second
antenna multiplexing filters and coupling the
20 combined signal to a first antenna for transmission.

16. A diversity transmission system
according to claim 14, wherein said at least one
other signal having at least a third carrier
frequency are generated by a fifth modulator and
25 fifth transmit power amplifier.

17. A diversity transmission system
according to claim 15, in which said at least one
other signal having at least a third carrier
frequency are produced by a fifth modulator and fifth
30 ~~transmit power amplifier.~~

OTHER NEW CLAIMS

~~18. A diversity transmission system~~
 according to claim 17, in which said at least one
 other signal having at least a fourth carrier
 frequency are produced by a sixth modulator and
 5 sixth transmit power amplifier.

19. A diversity transmission system
 according to claim 15 further comprising:
 a third modulator for modulating a
 second set of information signals on to said second
 10 radio carrier frequency;
 a fourth modulator for modulating at
 least one of said first set of information signals on
 to said first radio carrier frequency;
 a third transmit power amplifier for
 15 said third modulated signal at said second carrier
 frequency;
 a fourth transmit power amplifier for
 said fourth modulated signal at said first carrier
 frequency;
 20 a third antenna multiplexing filter
 that combines an output of said third transmit power
 amplifier with at least one signal having at least a
 fourth carrier frequency intended for transmission
 from the same antenna;
 25 a fourth antenna multiplexing filter
 that combines an output of said fourth transmit power
 amplifier with at least one other signal having at
 least a third carrier frequency intended for
 transmission from the same antenna; and
 30 a radio frequency combining network
 for combining the outputs of said third and fourth
 antenna multiplexing filters and coupling the
~~combined signal to a second antenna for transmission.~~

~~20. A diversity transmission system~~
comprising:

a first modulator for modulating a first set of information signals on to a first radio carrier frequency;

a second modulator for modulating at least one of a second set of information signals on to a second radio carrier frequency; and

a radio frequency combining network
for combining outputs of said first and second modulators and coupling the combined signal to a common power amplifier and antenna for transmission.

21. The diversity transmission system as in claim 20 further comprising:

a third modulator for modulating said second set of information signals on to said second radio carrier frequency;

a third transmit power amplifier for said third modulated signal at said second carrier frequency, the output of which is fed to a second antenna for transmission.

22. The diversity transmission system as in claim 20 further comprising:

a third modulator for modulating said second set of information signals on to said second radio carrier frequency;

a fourth modulator for modulating at least one of said first set of information signals on to said first radio carrier frequency;

~~a second radio frequency combining~~
 network for combining outputs of said third and
 fourth modulators and coupling the combined signal to
 a second common power amplifier and antenna for
 5 transmission.

23. A diversity transmission system
 comprising:

a first modulator for modulating a
 first set of information signals on to a first radio
 10 carrier frequency;

a second modulator for modulating at
 least one of a second set of information signals on
 to a second radio carrier frequency; and

a radio frequency combining network
 15 for combining outputs of said first and second
 modulators with other signals having different
 carrier frequencies and coupling said combined signal
 to a common power amplifier and antenna for
 transmission.

20 24. The diversity transmission system
 according to claim 20 in which said common transmit
 power amplifier is a linear or linearized power
 amplifier designed to minimize intermodulation
 between said signals.

25 25. The diversity transmission system
 according to claim 5 in which said at least one of
 said second set of signals is transmitted at a power
 level lower than the transmission of said first set
 of signals.

~~26. A radio transmission system for multiple signals comprising:~~

first transmit means for modulating a first set of information signals onto even-numbered
5 radio channels and amplifying said first set of information signals to produce a first set of transmit signals;

second transmit means for modulating a second set of information signals onto odd-numbered
10 radio channels and amplifying said second set of information signals to produce a second set of transmit signals;

third transmit means for modulating selected ones of said first set of information
15 signals onto respectively assigned even-numbered radio channels and amplifying said selected signals to produce a diversity transmit signal;

first transmit multiplexer means for multiplexing said first set of transmit signals to
20 form a first composite signal and feeding said first composite signal to a first antenna means;

second transmit multiplexer means for multiplexing said second set of transmit signals to form a second composite signal, and

25 coupling means for coupling said second composite signal and said diversity transmit signal to a second antenna means.

27. A transmission system as in claim 26 in which said first antenna means and said second
30 antenna means comprise orthogonal polarization inputs
~~of a dual-polarization antenna.~~

INSERT NEW CLAIMS

~~28. The transmission system of claim 2,~~
wherein said first and second antennas comprise
orthogonal polarizations of a dual-polarization
antenna.

5 29. The transmission system of claim 3,
wherein said first and second antennas comprise
orthogonal polarizations of a dual-polarization
antenna.

10 30. The transmission system of claim 19,
wherein said first and second antennas comprise
orthogonal polarizations of a dual-polarization
antenna.

15 31. The transmission system of claim 21,
wherein said first and second antennas comprise
orthogonal polarizations of a dual-polarization
~~antenna.~~

INSERT NEW CLAIMS

USE OF DIVERSITY TRANSMISSION TO RELAX ADJACENT CHANNEL
REQUIREMENTS IN MOBILE TELEPHONE SYSTEMS

ABSTRACT

The present invention includes a system and method for reducing adjacent channel interference, particularly in CDMA radiotelephone systems.

- 5 Diversity transmissions are provided for weaker signals to be transmitted by coupling delayed or advanced versions of these weaker signals to an antenna which is also transmitting signals on an adjacent frequency.

Figure 1